CB Radio

Model DX 919

Service Manual©



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CHAPTER 1 SPECIFICATIONS

1.0 GENERAL

Model	DX 919
Channels	40
Frequency Range	26.965 – 27.405 MHz
Emission Modes	AM
Frequency Control	Phase Lock Loop (PLL) synthesizer
Frequency Tolerance	0.005 %
Frequency Stability	0.001 %
Operating Temperature Range	-30°C to +50°C
Microphone	Dynamic PTT, 500 Ω
Input Voltage	13.8V DC
Antenna Connector	UHF; SO239
Dimensions	7 1/4"(W) x 9"(D) x 2 1/4"(H)
Weight	3.4 lbs.

1.1 TRANSMITTER

RF Power Output	AM : 4 watts
RF Transmit Modes	AM
Modulation	High and Low level Class B, Amplitude Modulation
Spurious Emissions	- 60dB
Carrier Suppression	- 60dB
Audio Frequency Response	300 to 2500 Hz
Antenna Impedance	50 Ohms
Output Indicators	Meter shows incoming signal strength, RF output power, SWR and AM Modulation level. Transmit LED glows red when transmitter is in operation.

1.2 RECEIVER

Sensitivity For 10dB S/N	< 0.5μV
IF Frequency	AM: 10.695 MHz 1st IF, 455 KHz 2nd IF
Image Rejection	- 50dB
Adjacent Channel Selectivity	- 60dB
RF Gain Control	45dB adjustable for optimum signal reception
Automatic Gain Control (AGC) Figure Of Merit	100mV for 10dB Change in Audio Output
Squelch	Adjustable; threshold less than 0.5μV
Noise Blanker	RF type
Audio Output Power	2.5W @ 10% THD
Audio Frequency Response	300 to 2500 Hz
Built-in Speaker	8 Ohms, 4 Watts
External Speaker (Not Supplied)	8 Ohms, 4 Watts

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

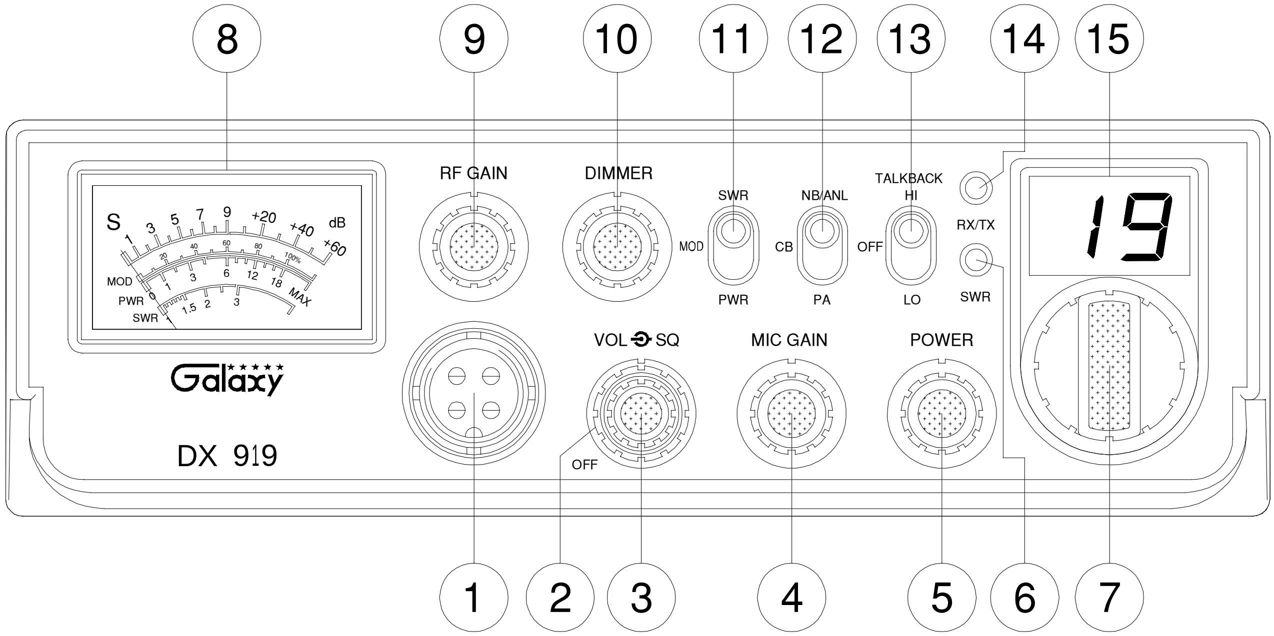


Figure 2-1 Front Panel

2.0 INTRODUCTION

This section explains the basic operating procedures for the DX 919 mobile CB radio.

2.1 CONTROLS AND CONNECTIONS

2.1.1 FRONT PANEL

Refer to the above Figure 2-1 for the location of the following controls.

1. MICROPHONE JACK

Used to connect microphone for voice source.

2. SQUELCH CONTROL

This knob is used to eliminate background noise being heard through the receiver, which can be disturbing when no transmissions are being heard through the receiver. To use this feature, turn the knob fully counterclockwise and then turn clockwise slowly until the background noise is just eliminated. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting.

3. ON/OFF VOLUME CONTROL

This knob controls the volume and power to the radio. To turn radio on, rotate the knob clockwise. Turning the knob further will increase the volume of the receiver.

4. MIC GAIN CONTROL
Adjusts the microphone gain in the transmit and PA modes. This controls the gain to the extent that full talk power is available several inches away from the microphone. In the Public Address (PA) mode, the control functions as the volume control.

5. POWER CONTROL
This control allows the user to adjust RF power output.

6. SWR LED
This LED lights red when your SWR is higher than about 3:1. This is not an exact indicator of 3:1 SWR, but it is an indication that you should check your SWR reading.

7. CHANNEL SELECTOR
This control is used to select the desired transmit and receive channel.

8. FRONT PANEL METER
The front panel meter allows the user to monitor incoming signal strength, RF output power, SWR level and AM modulation level.

9. RF GAIN CONTROL
This control is used to reduce the gain of the RF (receive) amplifier under strong signal conditions.

10. DIMMER CONTROL
This knob controls the level of brightness for the meter lamp and channel display.

11. SWR/MOD/PWR SWITCH
This switch controls the function of the meter during the transmit mode. In the "SWR" position, the meter indicates the Standing Wave Ratio (SWR) of your antenna. There are no adjustments because the SWR circuit in this radio calibrates itself automatically. When the switch is in the "MOD" position, the green scale on the meter indicates your percentage of modulation in the AM mode only. They are most accurate when testing at maximum power output. When this switch is in "PWR" position, the meter indicates your power output.

12. NB-ANL/CB/PA SWITCH
When the switch is in the NB/ANL position, the Noise Blanker (NB) and Automatic Noise Limiter (ANL) circuits are activated. The Noise Blanker is very effective in eliminating repetitive impulse noise such as ignition interference. In the CB position, the PA function is disabled and the radio will transmit and receive on the speaker that is connected. In the PA position, the radio acts as public address amplifier. Your voice will come out of the speaker that is plugged into the PA. SP. jack on the rear panel. The radio does not operate when you are in the PA mode.

13. TALKBACK SWITCH
This feature is used to monitor your own voice. For example, you could use this feature to compare different microphones. HI is high volume. LO is low volume. The Talkback circuit is off when the switch is in the OFF position.

14. RX/TX LED
This LED is green during receive and red during transmit.

15. CHANNEL DISPLAY
The channel display indicates the current selected channel.

2.1.2 REAR PANEL
Figure 2-2 represents the location of the following connections:

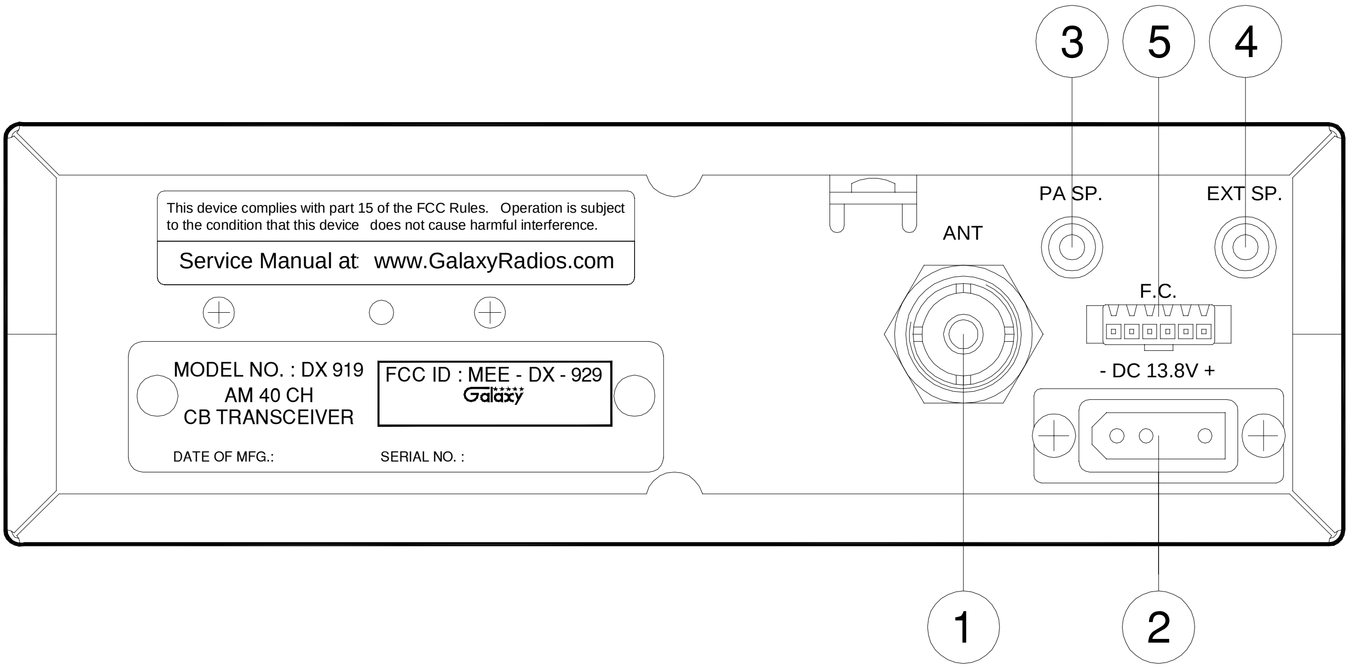


Figure 2-2 Rear Panel

1. ANTENNA
This jack accepts a 50-ohm coaxial cable with a PL-259 type plug.

2. DC POWER
This jack accepts the 13.8V DC power cable with built-in fuse. The power cord provided with the radio has a black and red wire. The black goes to negative and red goes to positive.

3. PA SP
This jack is for PA operation. Before operating, you must first connect a PA speaker (8 ohms, 4W) to this jack.

4. EXT. SP
This jack accepts a 4 to 8 ohm, 5-watt external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.

5. F.C.
This jack is used to connect the optional Galaxy FC347 six-digit frequency counter. All connections, including DC power, are provided to the FC347 through this jack.

2.1.3 FREQUENCY CHART

CHANNEL	CHANNEL FREQUENCY (MHz)	CHANNEL	CHANNEL FREQUENCY (MHz)
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

2.2 MICROPHONE

The push-to-talk switch on the microphone controls the receiver and transmitter. Press the switch and the transmitter is activated, release switch to receive. When transmitting, hold the microphone two inches from your mouth and speak clearly in a normal voice. This transceiver comes complete with a low impedance dynamic microphone.

2.3 OPERATION

2.3.1 PROCEDURE TO RECEIVE

1. Be sure that the power source, microphone and antenna are connected to the proper connectors before going to the next step.

2. Turn **VOL** knob clockwise to apply power to the radio.

3. Set the **VOL** to a comfortable listening level.

4. Set the **MODE** switch to the desired mode.

5. Listen to the background noise from the speaker. Turn the **SQUELCH** knob slowly clockwise until the noise just disappears. The **SQUELCH** is now properly adjusted. The receiver will remain quiet until a signal is actually received. Do not advance the control too far or some of weaker signals will not be heard.

6. Set the **CHANNEL** selector switch to the desired channel.

7. Set the **RF GAIN** control fully clockwise for maximum RF gain.

2.3.2 PROCEDURE TO TRANSMIT

1. Select the desired channel of transmission

2. Set the **MIC GAIN** control fully clockwise.

3. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice.

2.4 ALTERNATE MICROPHONES AND INSTALLATION

For best results, the user should select a low impedance dynamic type microphone or a transistorized microphone. Transistorized type microphones have a low output impedance characteristic. The microphones must be provided with a four-lead cable. The audio conductor and its shielded lead comprise two of the leads. The third lead is for transmit control and the fourth is for receiving control.

The microphone should provide the functions shown in the schematic below (Figure 2-3).

4 WIRE MIC CABLE

Pin Number	Mic Cable Lead
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control

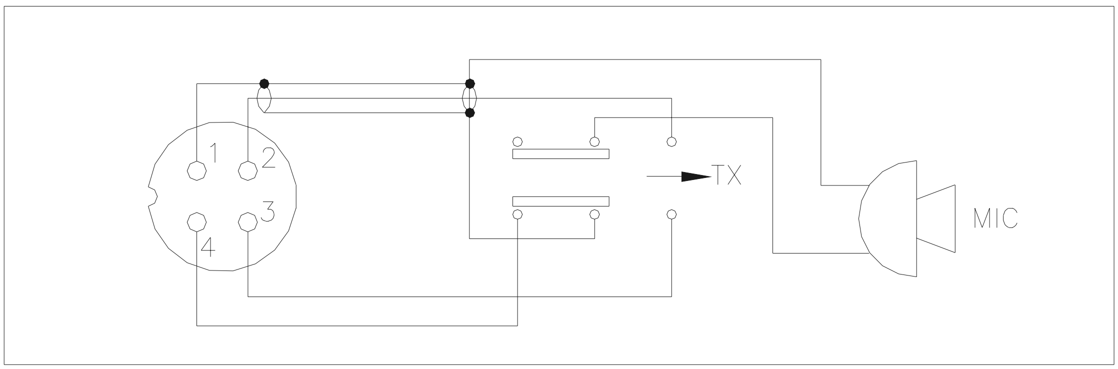


Figure 2-3 Your Transceiver Microphone Schematic

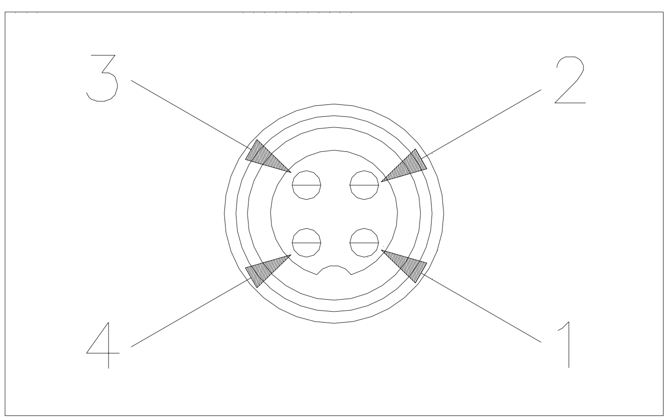


Figure 2-4 Microphone plug and pin numbers viewed from rear of pin receptacle.

3.0 INTRODUCTION

This section explains the technical theory of operation for the DX 919 mobile CB radio.

3.1 PLL CIRCUIT

The Phase Lock Loop (PLL) circuit is responsible for developing the receiver's first local oscillator signal and the transmitter's exciter signal. The PLL circuit consists primarily of IC2, IC3, Q25, Q29 and Q28. The PLL circuit is programmed by the rotary channel switch GPS-668. The GPS-668 communicates the correct binary data information to the programmable divider inside of IC3. IC3 then controls the VCO (Voltage Controlled Oscillator) to oscillate on the correct frequency. This signal is fed either into the receiver's first mixer (for receive operation) or the transmitter's mixer (for transmit operation).

3.2 RECEIVER CIRCUIT

The incoming RF signal comes into the radio via the antenna and into the front-end pre-amp, Q17. The RF signal is fed into the mixer circuit of Q18/Q19 and then into the AM IF section of the receiver. The signal is then detected by the AM detector and then fed to the audio amplifier section of the receiver and finally out to the speaker.

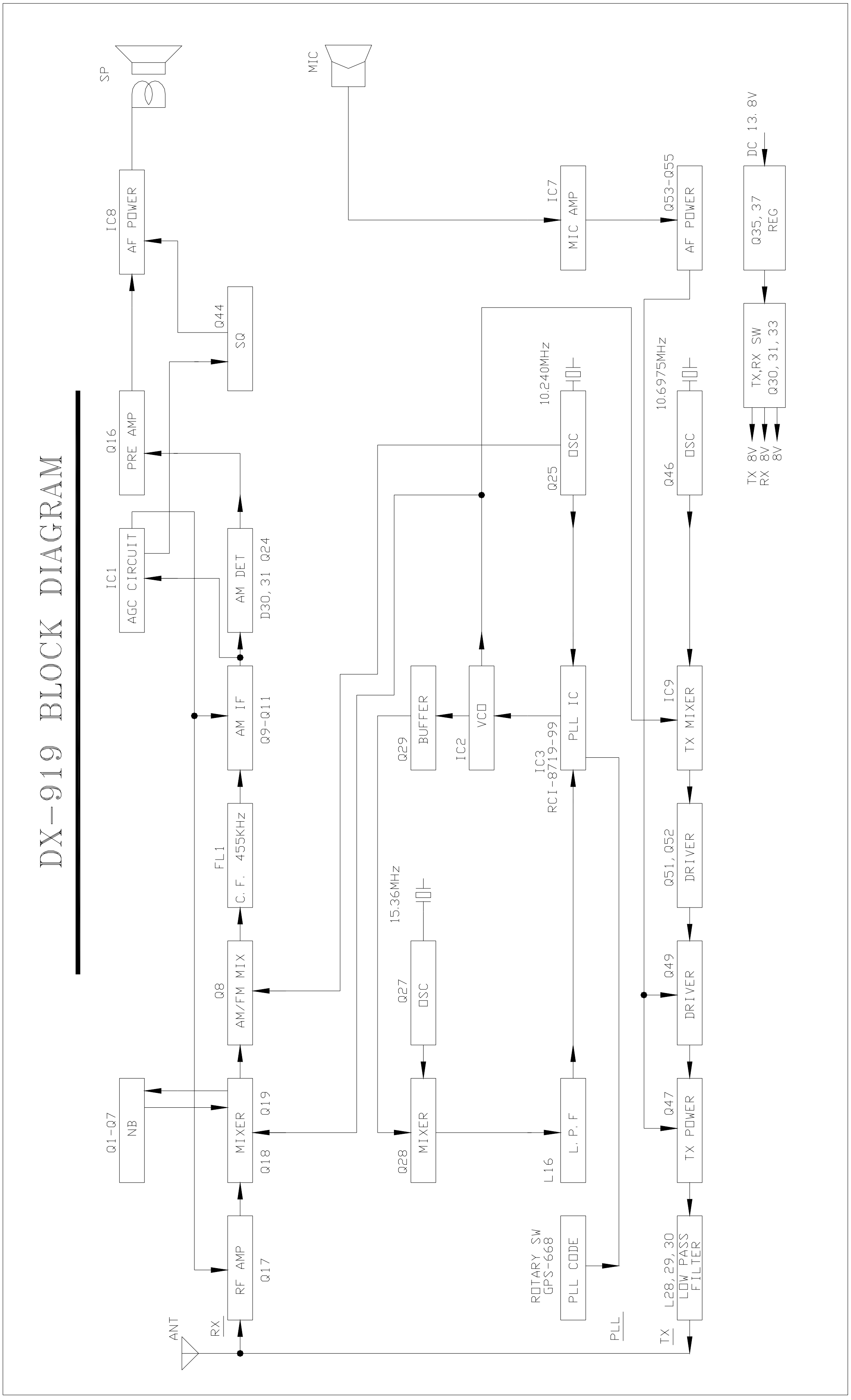
3.3 TRANSMITTER MODULATION CIRCUIT

(1) The transmitter modulation circuit modulates the low-level RF signal from the PLL exciter circuit with the user's audio voice signal from the microphone. The audio from the microphone is then amplified and fed into the transmit amplifier circuit.

(2) The AF power amplifier modulates the last RF amplifier, which produces a true amplitude modulated RF signal.

3.4 TRANSMITTER AMPLIFIER CIRCUIT

The transmitter takes the basic exciter signal from IC9 of the TX mixer and amplifies it through a series of amplifiers consisting of Q52, Q51, Q49 and Q47 where it is sent out to the antenna connector.


DX-919 BLOCK DIAGRAM
SP
MIC
IC8
AF POWER
Q44
SQ
Q16
PRE AMP
IC1
AGC CIRCUIT
AM DET
D30,31 Q24
AM IF
Q9-Q11
FL1
C.F. 455KHz
Q8
AM/FM MIX
Q1-Q7
NB
MIXER
Q18
Q19
RF AMP
Q17
ANT
RX
IC7
MIC AMP
Q53-Q55
AF POWER
DC 13.8V
Q35,37
REG
TX,RX SW
Q30,31,33
TX 8V
RX 8V
8V
10.240MHz
Q25
OSC
10.6975MHz
Q46
OSC
IC3
RCI-8719-99
PLL IC
IC2
VCO
Q29
BUFFER
IC9
TX MIXER
Q51,Q52
DRIVER
Q49
DRIVER
Q47
TX POWER
L28,29,30
LOW PASS
FILTER
15.36MHz
Q27
OSC
Q28
MIXER
L16
L.P.F
ROTARY SW
GPS-668
PLL CODE
PLL
TX

4.0 REQUIRED TEST EQUIPMENT

① DC Power Supply (13.8VDC, 10A)
② RF Wattmeter (10W)
③ Multi-meter
④ Automatic Modulation Meter
⑤ Audio Signal Generator
⑥ Frequency Counter (100 MHz)
⑦ RF Signal Generator (100 MHz)
⑧ Automatic Distortion Meter
⑨ Oscilloscope (50 MHz)
⑩ Sinad Meter

4.1 ALIGNMENT PROCEDURES

This transceiver has been aligned at the factory and does not require any adjustments at installation. The required test equipment listed are used for the test setup or alignment shown in Figure 4-1 Transmitter Test Setup and Figure 4-2 Receiver Test Setup. These test setups are used in part or total during the following adjustments. Refer to page 14 for adjustment locations.

4.1.1 PLL ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
VCO	Set radio to CH 1 AM RX mode. Connect Multi-meter to TP2.	L14	2.5 VDC ± 0.1
	Connect Oscilloscope to TP3.	L15	Adjust for max.
	Connect Frequency Counter to IC3 Pin 8.	VC1	10.2400MHz ± 20Hz
AM Frequency	Set radio to CH 19 AM RX mode. Connect Frequency Counter to TP3.	L20	16.4900MHz ± 20Hz
AM OSC	Set radio to CH 19 AM TX mode. Connect Frequency Counter to TP5.	L23	10.6950MHz ± 10Hz

4.1.2 TRANSMITTER ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
TX Power	Set radio to CH 19 AM TX mode. Connect RF Power Meter to antenna jack. Set SWR/MOD/PWR Switch to PWR.	L40, L42, L43, L44	MAX > 12W Balance Power Between CH. 1- 40.
AM TX High Power	Set radio to CH 19 AM TX mode. Set modulation to off Set RF POWER fully clockwise.	VR14	3.8 W
AM TX Low Power	Set RF POWER fully counterclockwise.	VR18	0.3W±0.2W
RF Power Meter	Set radio to CH 19 AM TX mode. Set RF POWER fully clockwise. Set SWR/MOD/PWR Switch to PWR position.	VR9	For a needle reading of "4" on TX PWR scale.
AM TX Modulation	Set radio to CH 19 AM TX mode. AF signal 30mV, 1 KHz to microphone. Set MIC Gain fully clockwise. Set SWR/MOD/PWR Switch to MOD position	VR16	For a needle reading of 90% on the external modulation meter.
AM Modulation Meter	Set radio to CH 19 AM TX mode. AF signal 30mV, 1 KHz to microphone. Set MIC Gain fully clockwise.	VR15	For a needle reading of 90% on the modulation scale.

4.1.3 RECEIVER ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
AM Sensitivity	Set radio to CH 19 AM RX mode. Set RF GAIN fully clockwise. Set SQ fully counter-clockwise. Set VOL Control at 2 o'clock. Connect RF SG to antenna jack Frequency 27.185 MHz, 1uV. Mod 30%.	L5, L6, L7, L8, L9, L10, L2, L3	Audio Output > 2V S/N > 10 dB.
	Set radio to CH 40 AM RX mode. RF SG setting 27.405 MHz. Set radio to CH 1 AM RX mode. RF SG setting 26.965 MHz.	L5,L6	For Balance Between CH 1 and CH 40.
NB Adjust	Set radio to CH 19 AM RX mode RF SG setting 27.205 MHz, 100uV. Mod 30%. Set switch to NB/ANL position. Connect Multi-meter to TP1 (D2 cathode).	L1	DC Voltage to max. (> 2.0V)
AM Squelch	Set radio to CH 19 AM RX mode. Set SQ Control fully clockwise. RF SG setting 27.185 MHz, 20mV. Mod 30%.	VR4	Adjust very slowly until squelch just closes.
AM S-Meter	Set radio to CH 19 AM RX mode. RF SG setting 27.185 MHz, 100uV. Mod 30%.	VR1	For a reading of "9" on the "S" scale.

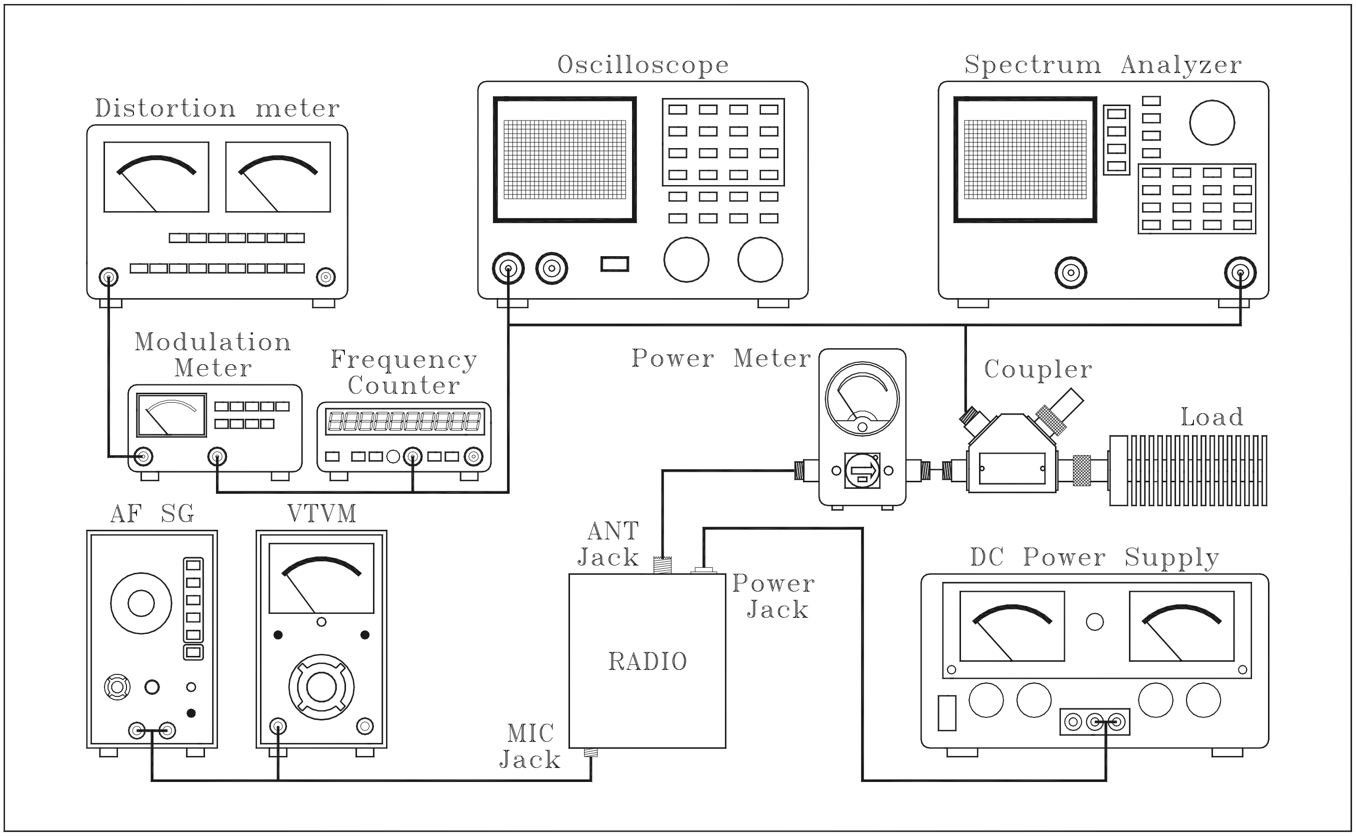


Figure 4-1 Transmitter test setup

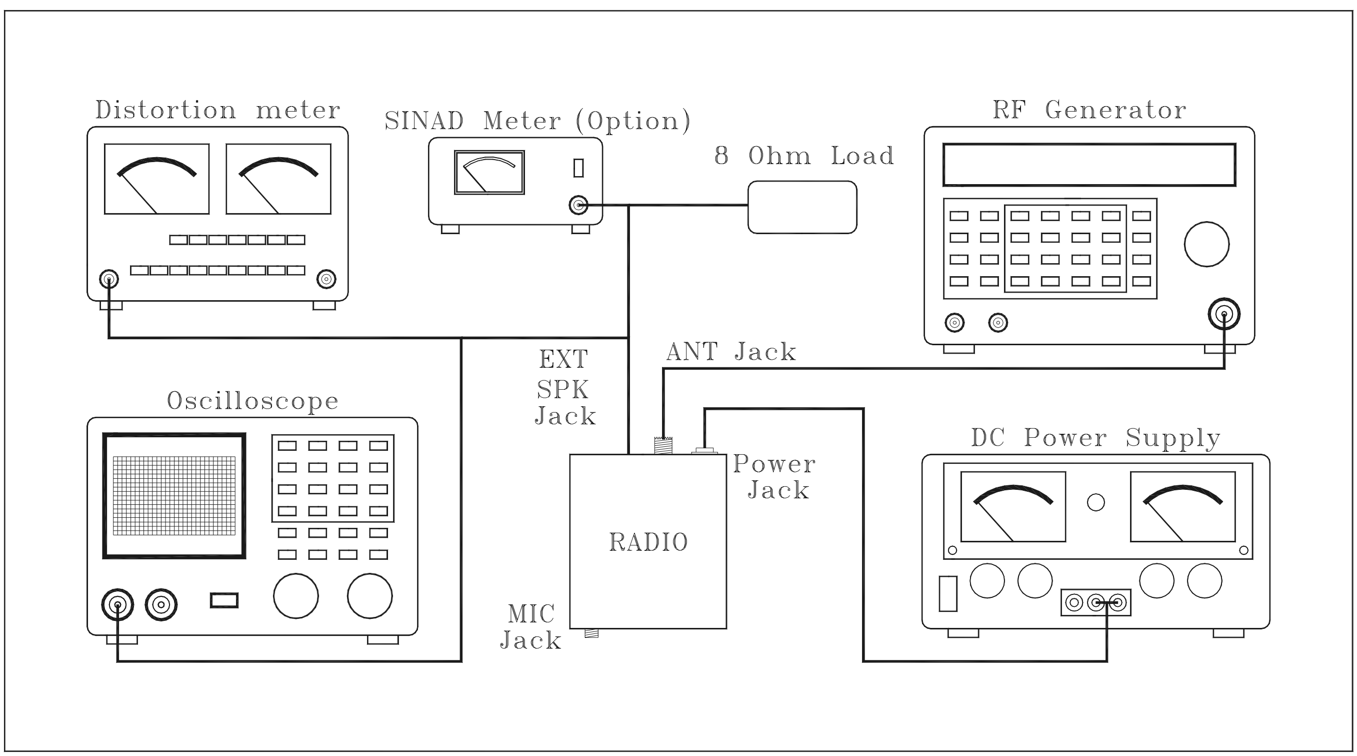
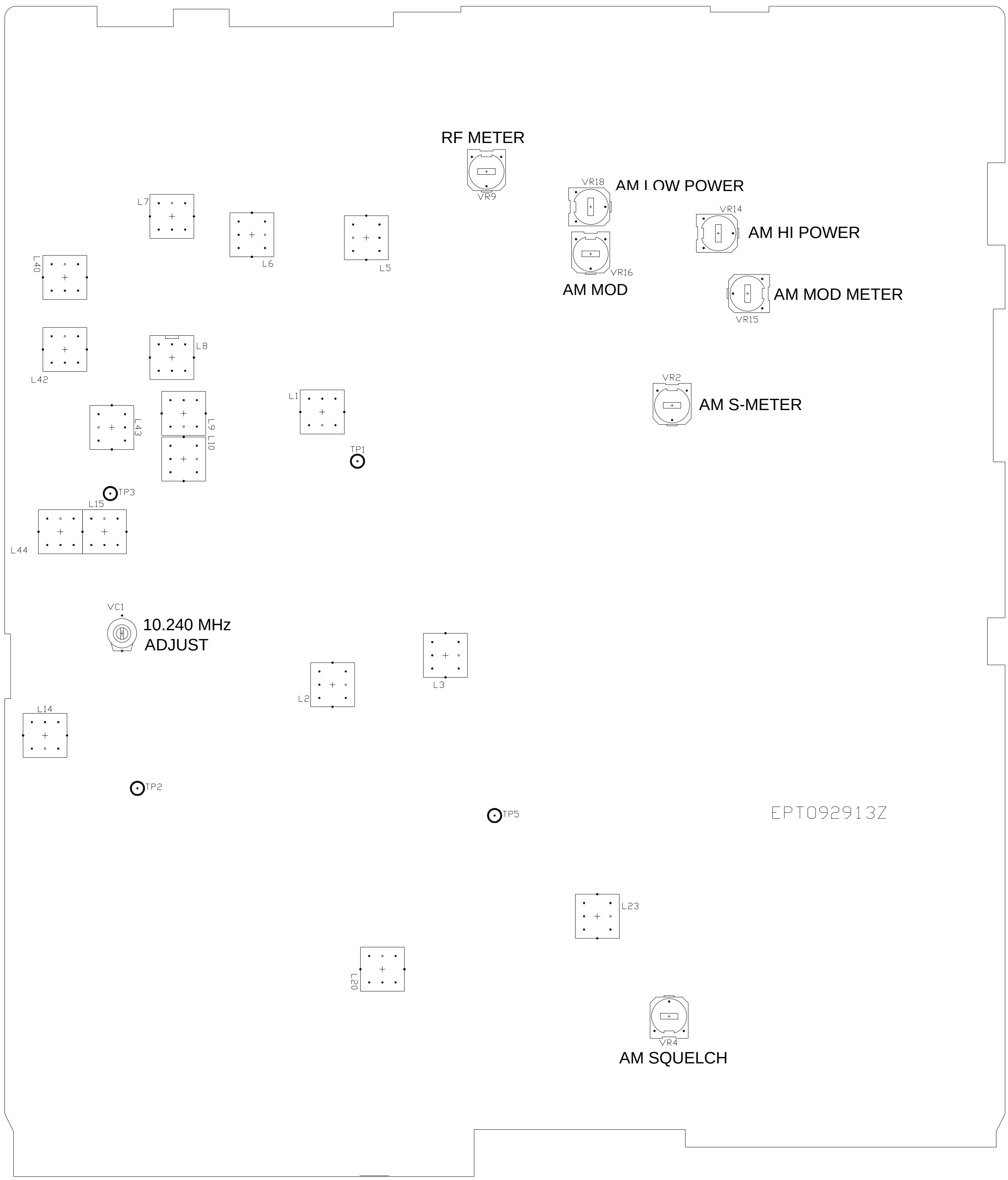


Figure 4-2 Receiver test setup

DX 919 MAIN PCB ADJUSTMENT LOCATION



5.0 PRECAUTIONS

The inherent quality of the solid-state components used in this transceiver will provide many years of continuous use. Taking the following precautions will prevent damage to the transceiver.

(i) Never key the transmitter unless an antenna or suitable dummy load is connected to the antenna receptacle.

(ii) Ensure that the input voltage does not exceed 16 VDC or fall below 11 VDC.

(iii) Transmitting over long periods can cause heat built-up and cause transmitter damage.

5.1 PERIODIC INSPECTION

This unit is aligned at the factory to deliver maximum performance. However, continued performance cannot be expected without periodic inspection and maintenance. Important points to be checked regularly are as follows;

Check Item	Action
Whip antenna (option)	If cracked or broken, replace it.
Coaxial cable	If sheath is cracked or immersed in water, install new coaxial cable.
Coaxial & power plug connections	If loosened, reconnect. If corroded, clean contacts.
Battery connection	If corroded, clean power terminals.
Ground terminal	If corroded, clean terminal.

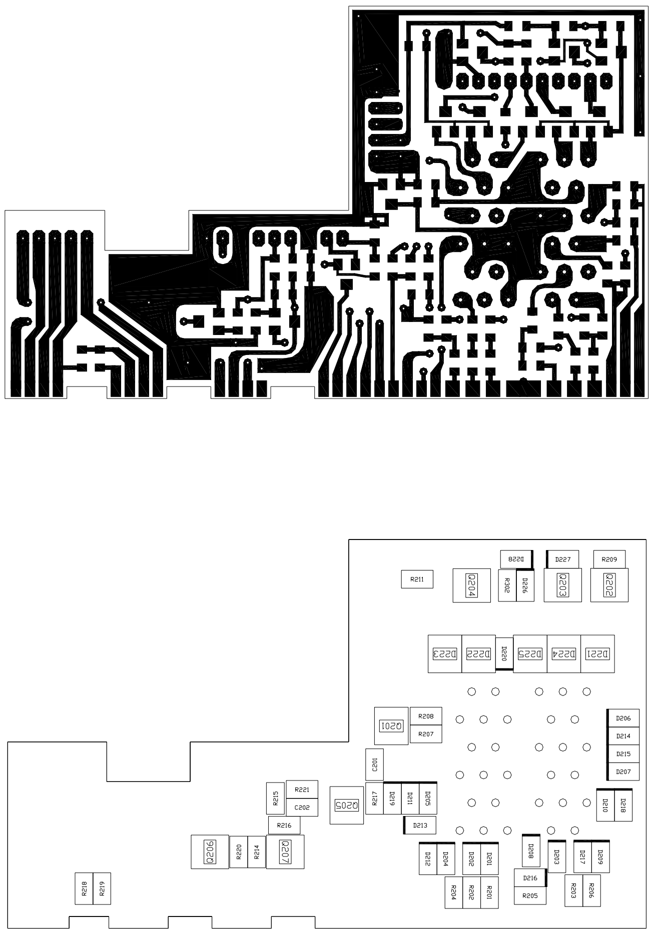
5.2 FUSE REPLACEMENT

To protect the equipment from serious damage, a fuse is provided on the power supply lines. The fuse protects against over voltage / reverse polarity or internal fault of the equipment. If the fuse has blown, first find out the cause of the trouble before replacing it. A fuse rated for more than the transceiver requirement should not be used, since it may permanently damage the equipment. Damage due to over fusing is not covered by the warranty.

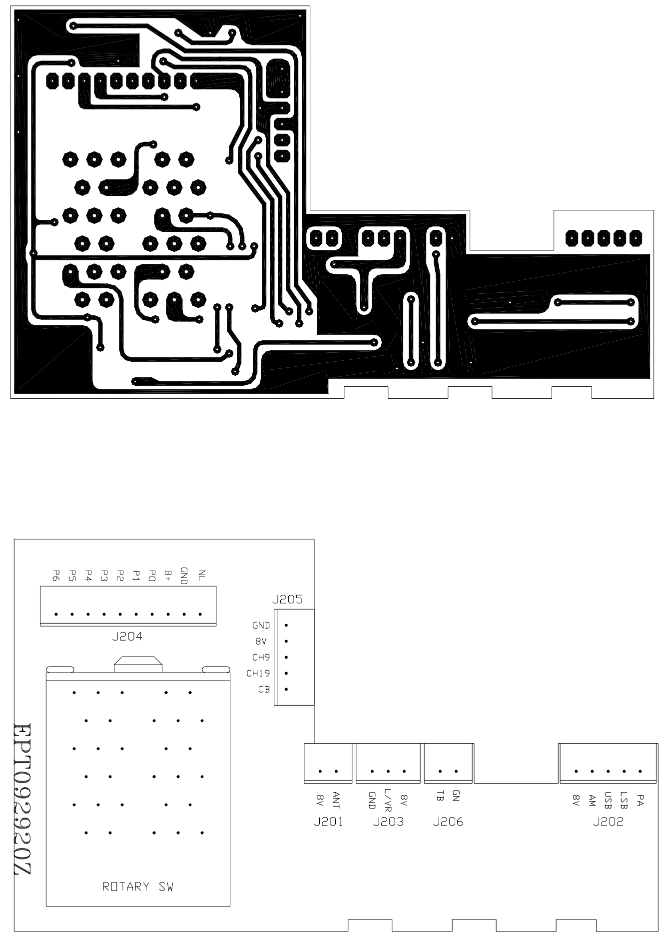
6.0 GENERAL

Information on most electrical and mechanical parts is included in the parts list. The reference designators are in alphanumeric order.

DX 919 ROTARY SWITCH PCB (EPT092920Z)



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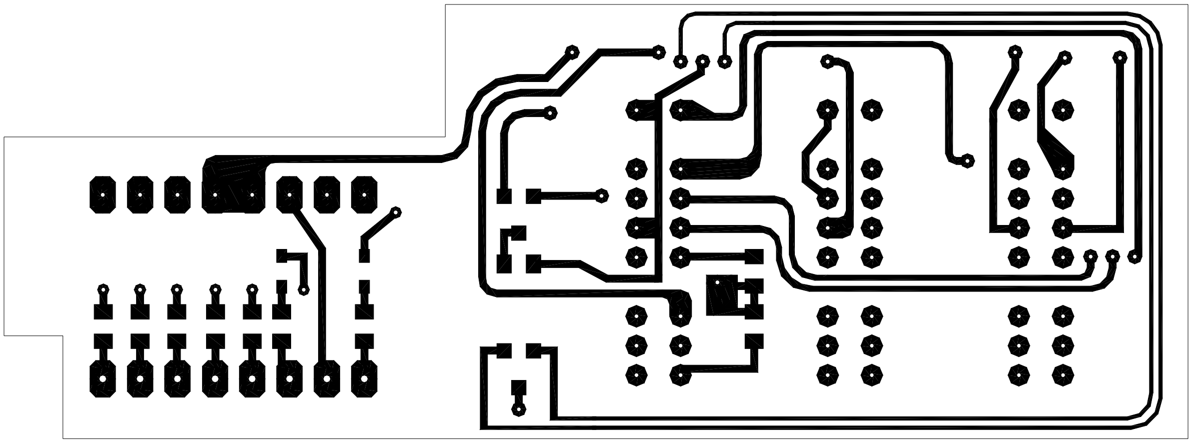
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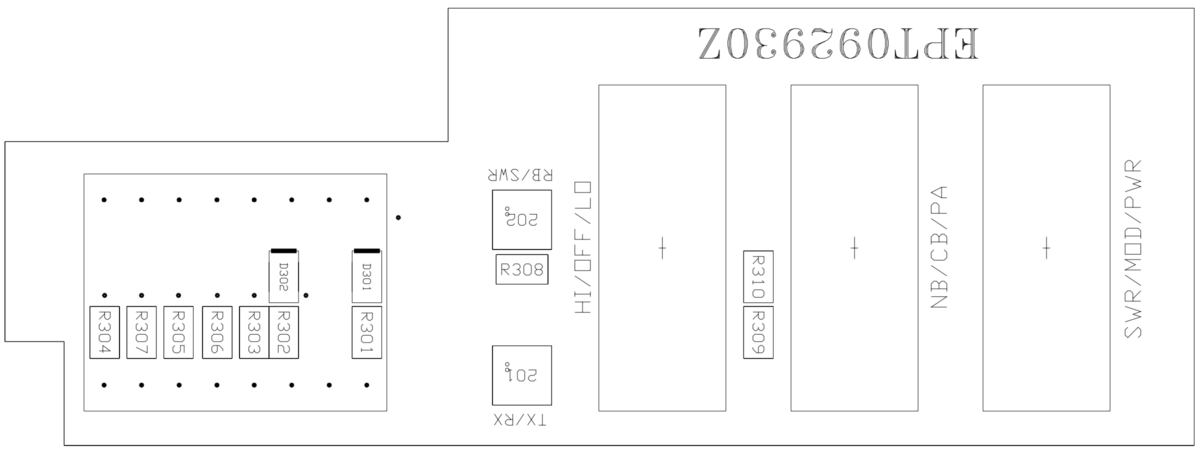
DX 919 ROTARY SW. P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT092920Z	ROTARY SW PCB
2	R207,R210,R218,R219	RCY010004Z	CHIP/F/R 0.0 Ω 0.1W
3	R201	RCY013314Z	CHIP/F/R 330 Ω 0.1W
4	R202,R203,R204,R205, R206	RCY016814Z	CHIP/F/R 680 Ω 0.1W
5	R215	RCY014724Z	CHIP/F/R 4.7K Ω 0.1W
6	R221	RCY016824Z	CHIP/F/R 6.8K Ω 0.1W
7	R214	RCY012234Z	CHIP/F/R 22K Ω 0.1W
8	R220	RCY016834Z	CHIP/F/R 68K Ω 0.1W
9	C201,C202	CK1104AB5X	CHIP/C 0.1uF 50WV
10	D201,D202,D203,D204, D205,D206,D207,D208, D209,D210,D211,D212, D13,D214,D215,D216,D217,D218,D219,D220,D226,D227,D228	EDSS00355Y	DIODE (S.M.D.) 1SS355
11	D221,D222,D223,D224, D225	EDSS00181Y	DIODE (S.M.D.) 1SS181-TE85L
12	Q207	TY2SC2712G	TR 2SC2712GR-TE85L
13	Q201,Q202,Q203,Q204, Q206	TYZRN1403Z	TR RN1403-TE85L
14	Q205	TYZRN2403Z	TR RN2403-TE85L
15	J201,J206	EX07N48223	PCB CONN/S 2 PIN
16	J203	EX07N48350	PCB CONN/S 3 PIN
17	J202	EX07N48222	PCB CONN/S 5 PIN
18	J204	EX07N48209	PCB CONN/S 10 PIN
19	ROTARY SW	EWRT32059S	ROTARY SW GPS-0668
20	J205	RCP160004Z	C/F/R 0.0 Ω 1/16W

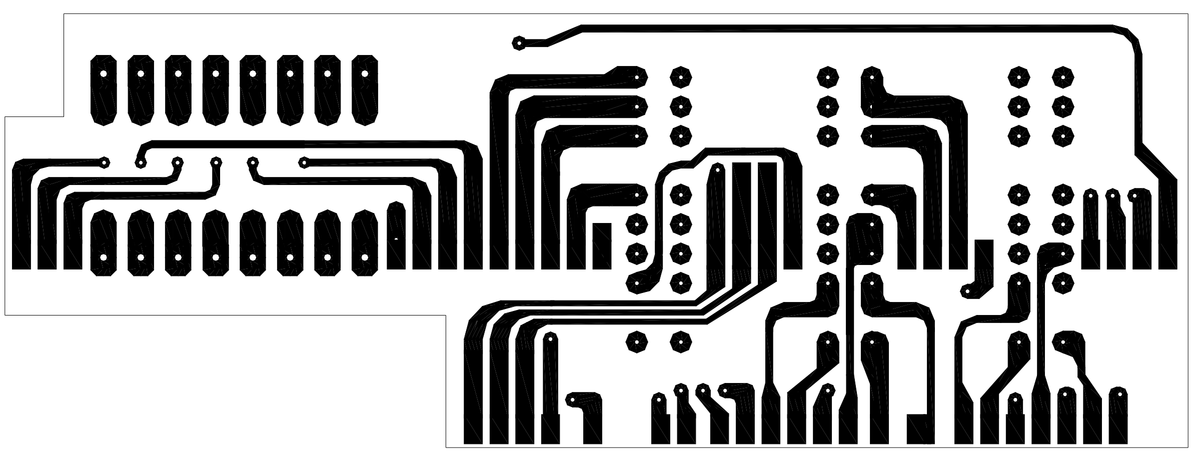
DX 919 DISPLAY PCB (EPT092930Z)



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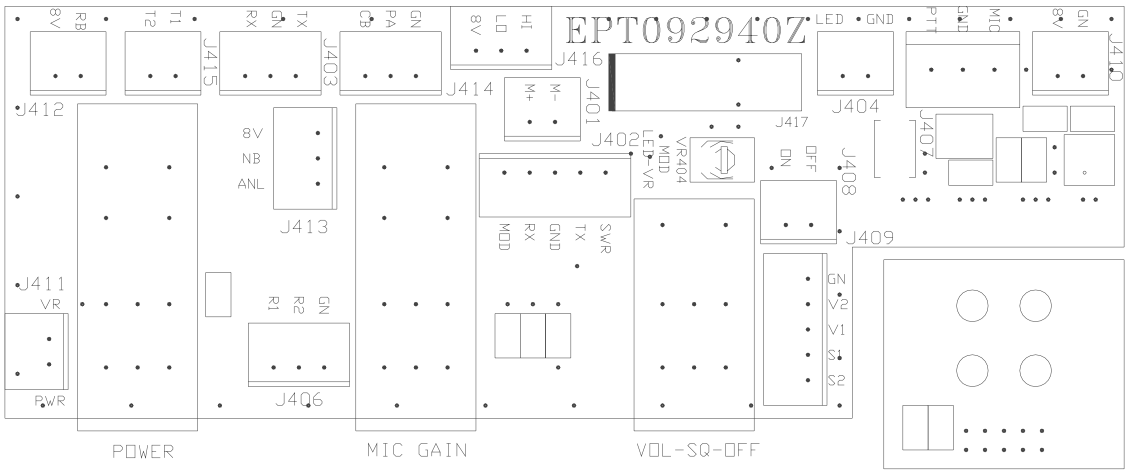
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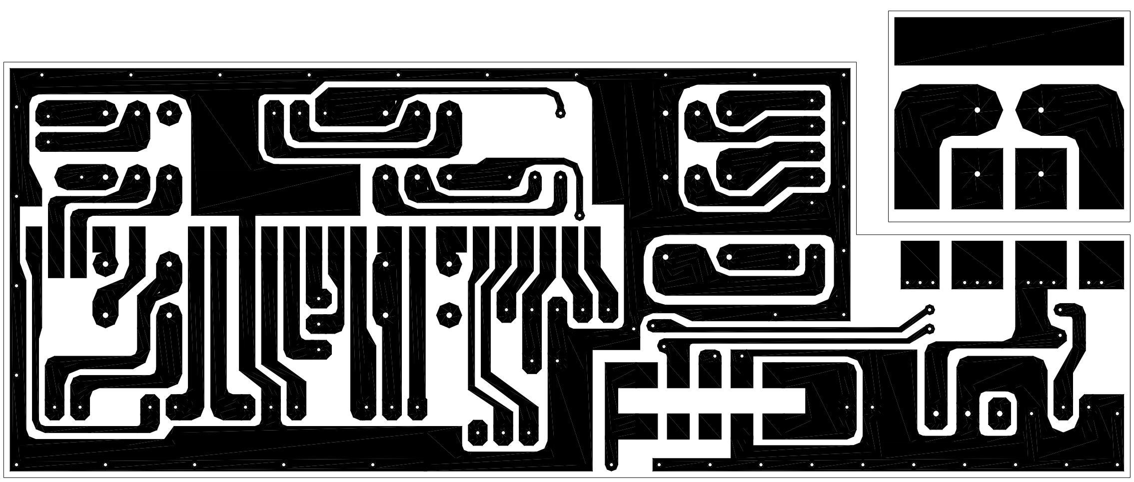
DX 919 DISPLAY P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT092930Z	DISPLAY PCB
2	R301,R302,R303,R304, R305,R306	RCY016814Z	CHIP/F/R 680 Ω 0.1W
3	R308	RCY011024Z	CHIP/F/R 1K Ω 0.1W
4	R310	RCY012224Z	CHIP/F/R 2.2K Ω 0.1W
5	R309	RCY012234Z	CHIP/F/R 22K Ω 0.1W
6	D301,D302	EDSS00355Y	DIODE 1SS355
7	LED201,LED202	EX01Y40114	LED LAMPS KM-23ESGC
8	DISPLAY	EX03N40419	LED DISPLAY TX-566
9	HI/OFF/LO,NB/CB/PA, SWR/MOD/PWR	EWSL31027K	SLIDE SW. 3N

DX 919 (POWER/MIC GAIN/VOL-SQ CONTROL) VR PCB (EPT092940Z)



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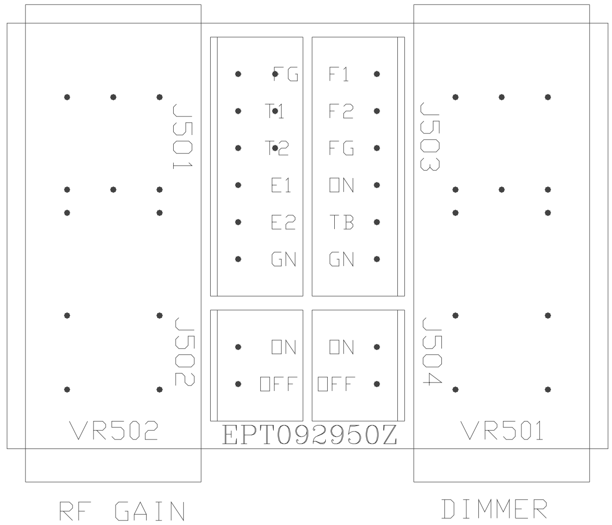
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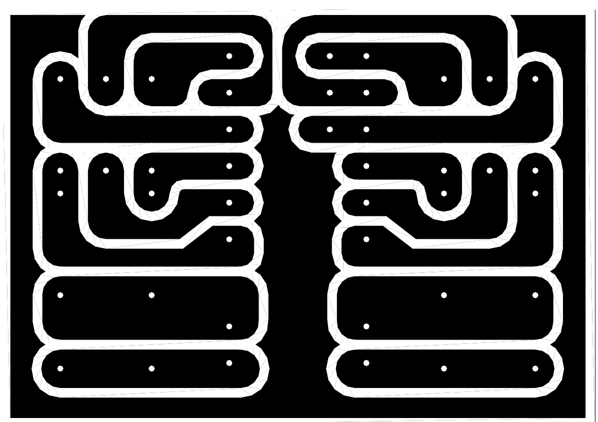
DX 919 POWER/MIC GAIN/VOL-SQ CONTROL, VR P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT092940Z	VR PCB
2	SH3027	RCY010004Z	CHIP/F/R 0.0 Ω 0.1W
3	R401	RCY011034Z	CHIP/F/R 10K Ω 0.1W
4	C401,C402	CK1102AB5X	CHIP/C .001uF 50VW
5	C403,C404	CK1103AB5X	CHIP/C .01uF 50VW
6	L402	YCTLI5653C	CHOKE COIL 5.6uH
7	L401	YCBAD18581	BEAD FERRITE COIL WB-403025
8	Q902	TYDTA124EA	T/R DTA124EUAT106
9	MIC GAIN	RV10203529	VR 1KA
10	VOL-SQ-OFF	RV50303522	V/R 50KB/50KA W/SW
11	POWER	RV50203525	VR 5KB
12	J401,J408,J410,J411, J415	EX07N48223	PCB CONN/S 2PIN
13	J403,J413	EX07N48350	PCB CONN/S 3PIN
14	J414	EX07W48824	PCB CONN/S 3PIN
15	J407	EX07N41216	PCB CONN/S 3PIN
16	J402	EX07N48222	PCB CONN/S 5PIN
17	J409	EX07W48826	PCB CONN/S 5PIN

DX 919 (RF GAIN/DIMMER CONTROL) VR PCB (EPT092950Z)



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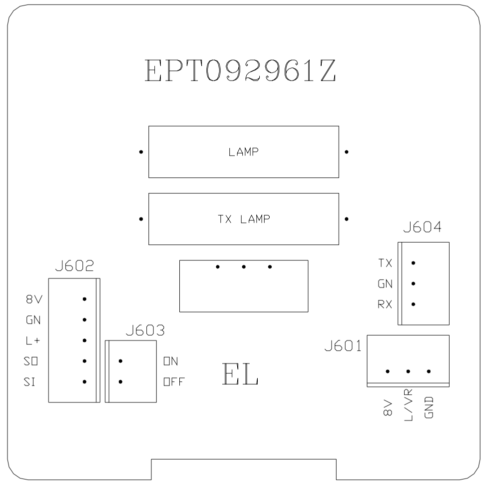
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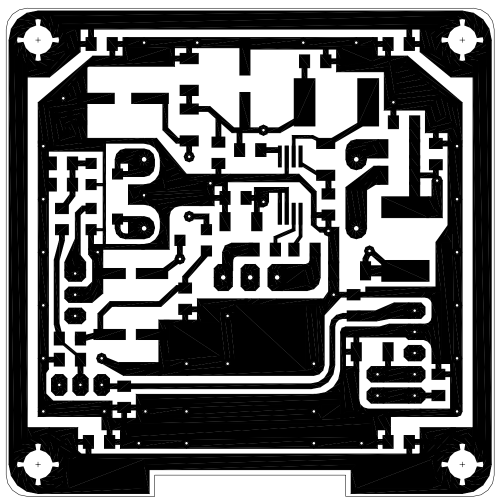
DX 919 RF GAIN/DIMMER CONTROL, VR P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT092950Z	TB PCB
2	VR501 (DIMMER)	RV50203525	VR 5KB
3	VR502 (RF GAIN)	RV10203528	VR 1KB
4	J501	EX07W48824	PCB CONN/S 3 PIN
5	J503	EX07N48350	PCB CONN/S 3 PIN

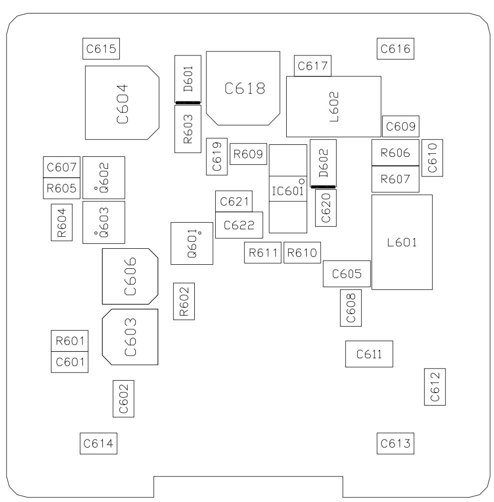
DX 919 METER PCB (EPT092961Z)



(COMPONENT SIDE)



(COPPER SIDE)



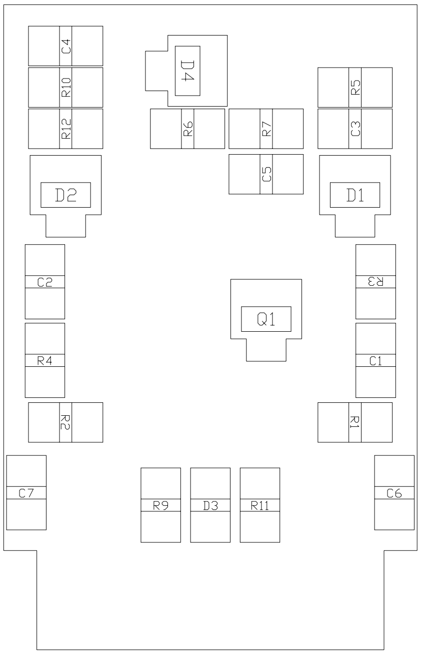
(COPPER SIDE-SMD)

PART LIST:

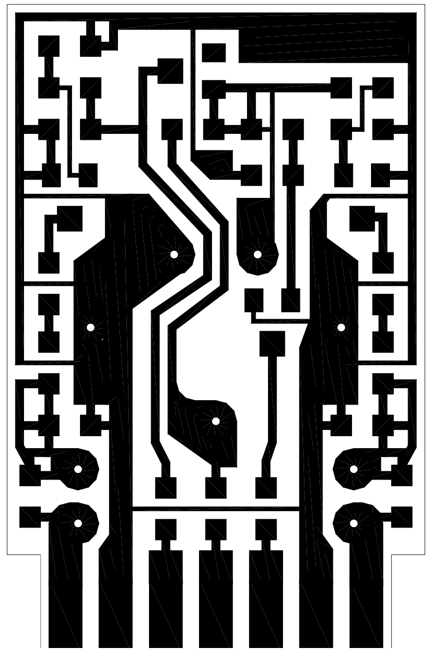
DX 919 METER PCB (Dimmer Circuit)

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT092961Z	METER PCB
2	R603	RCY011504Z	CHIP/F/R 15 Ω 0.1W
3	R606,R607	RCY144704Z	CHIP/F/R 47 Ω 1/4W
4	R605	RCY013324Z	CHIP/F/R 3.3KΩ 0.1W
5	R604	RCY011034Z	CHIP/F/R 10KΩ 0.1W
6	R601	RCY011234Z	CHIP/F/R 12KΩ 0.1W
7	R602	RCY014734Z	CHIP/F/R 47KΩ 0.1W
8	C602,C609,C613,C614, C615,616	CK1103AB5X	CHIP/C 0.01uF 50WV
9	C601,C607,C608,C610, C612	CK1104AB5X	CHIP/C 0.1uF 50WV
10	C605,C611	CK5475AA7R	CHIP/C 4.7uF 16WV
11	C603,C606	CEY254767Z	E/C 47uF 25WV
12	C604	CEY251077Z	E/C 100uF 25WV
13	Q601,Q602	TY2SC2712G	T/R 2SC2712GR-TE85L
14	Q603	TYDTC124EA	T/R DTC124EUAT106
15	L601	YCTLI4774E	CHOKE COIL 470uH
16	LAMP	EX02N40230	LAMP 0.05 12V
17	J603	EX07N48223	PCB CONN/S 2 PIN
18	J601	EX07N48350	PCB CONN/S 3 PIN
19	J602	EX07N48222	PCB CONN/S 5 PIN

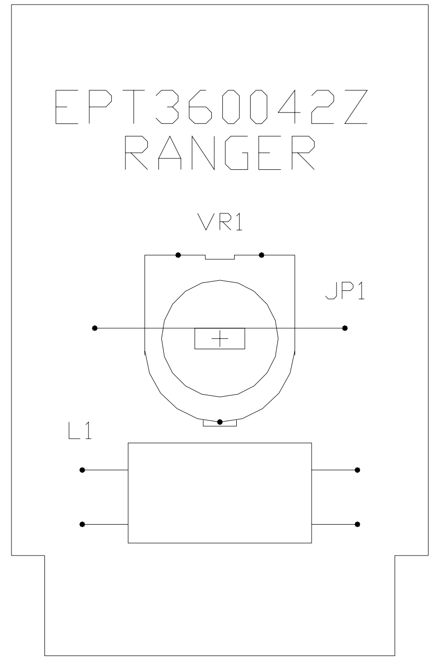
DX 919 ANTENNA PCB (EPT360042Z)



(COPPER SIDE-SMD)



(COPPER SIDE)



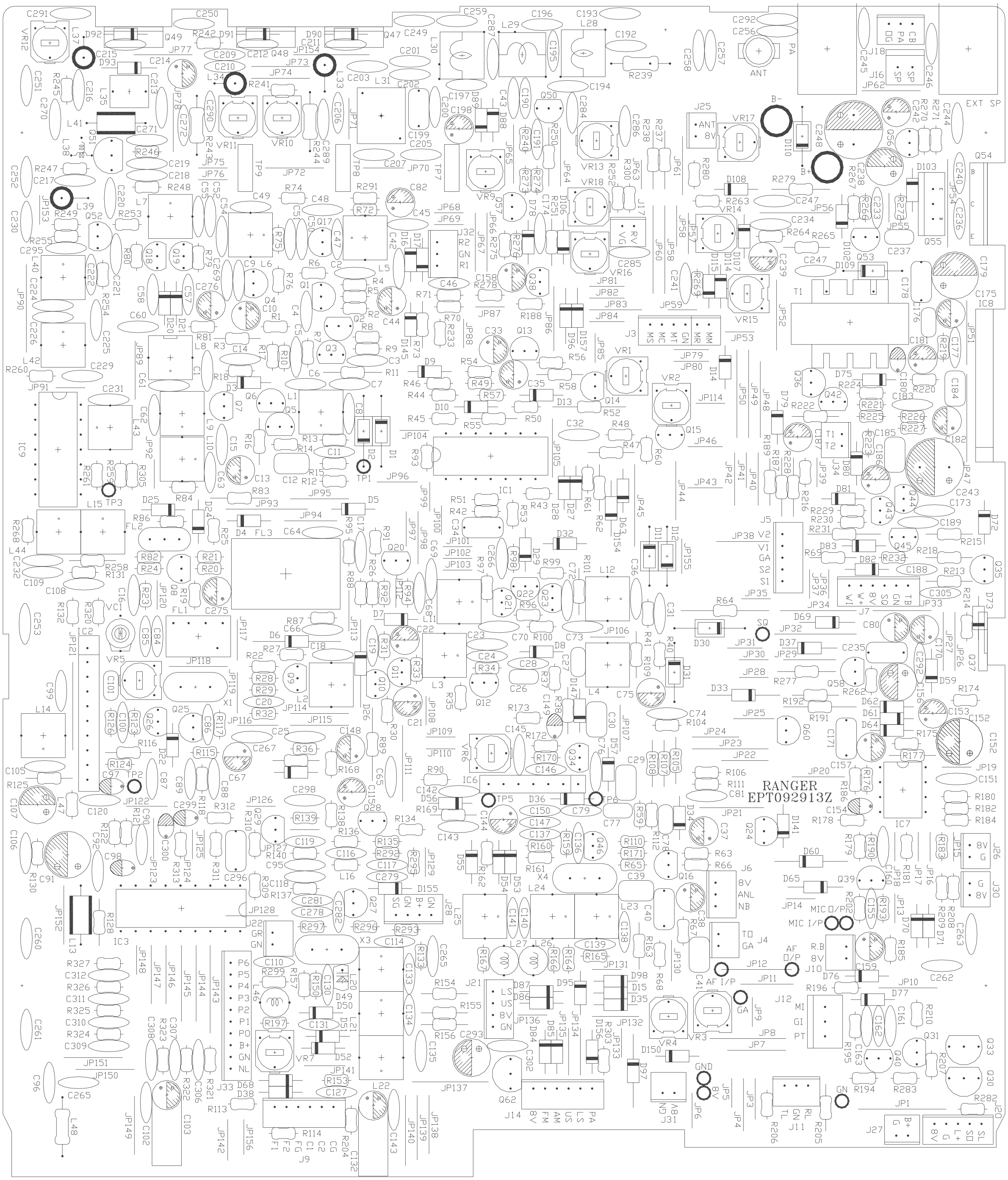
(COMPONENT SIDE)

PART LIST:

DX 919 ANT P.C.B

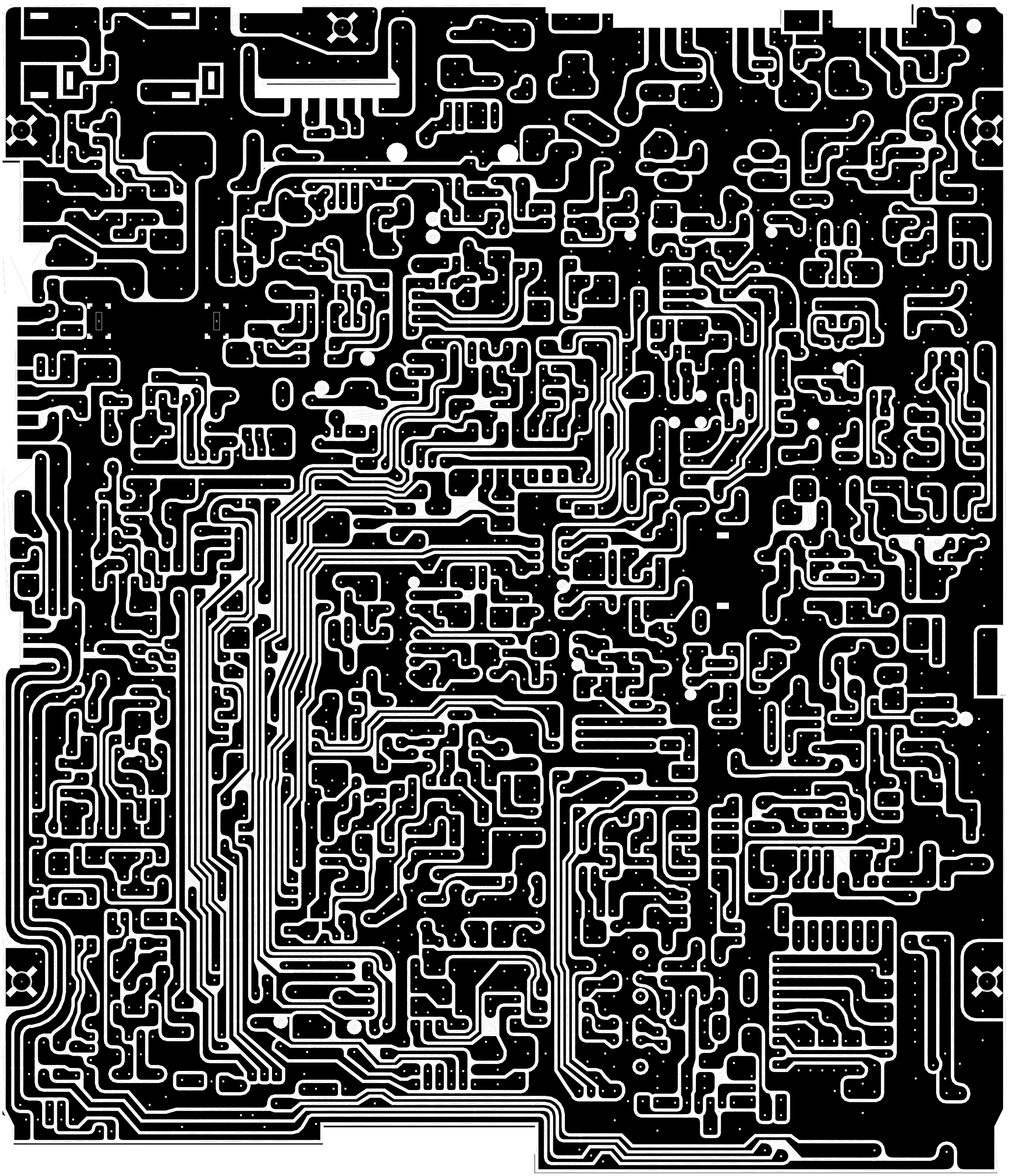
ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT360042Z	ANT P.C.B
2	R9	RCY010004Z	0 OHM 0.1W
3	R1	RCY014714Z	470 OHM 0.1W
4	R3,R4	RCY011014Z	100 OHM 0.1W
5	R2	RCY013314Z	330 OHM 0.1W
6	R5,R11	RCY011024Z	1K OHM 0.1W
7	R10,R12	RCY012224Z	2.2K OHM 0.1W
8	R7,C5	RCY011034Z	10K OHM 0.1W
9	C7	CK1059AB1A	0.5PF 50WV
10	C6	CK1030AB1A	3PF 50WV
11	C3,C4	CK2104AB7R	0.1uF 25WV
12	C1,C2	CK1103AB7L	0.001uF 50WV
13	Q1	TY2SC2712G	TR 2SC2712GR
14	D3	EDSS00355Y	DIODE 1SS355
15	D1,D2	EDHM0198SY	DIODE HSM198S
16	D4	EDMA0028TY	DIODE MA28T
17	L1	ECRFZ10053	RF COIL C3RH0610
18	VR1	RE10300009	S/F/R 10K OHM
19	JP1	WX01070715	JUMPER WIRE

DX 919 MAIN PCB (EPT092913Z)



(COMPONENTS SIDE)

DX 919 MAIN PCB (EPT092913Z)



(COPPER SIDE)

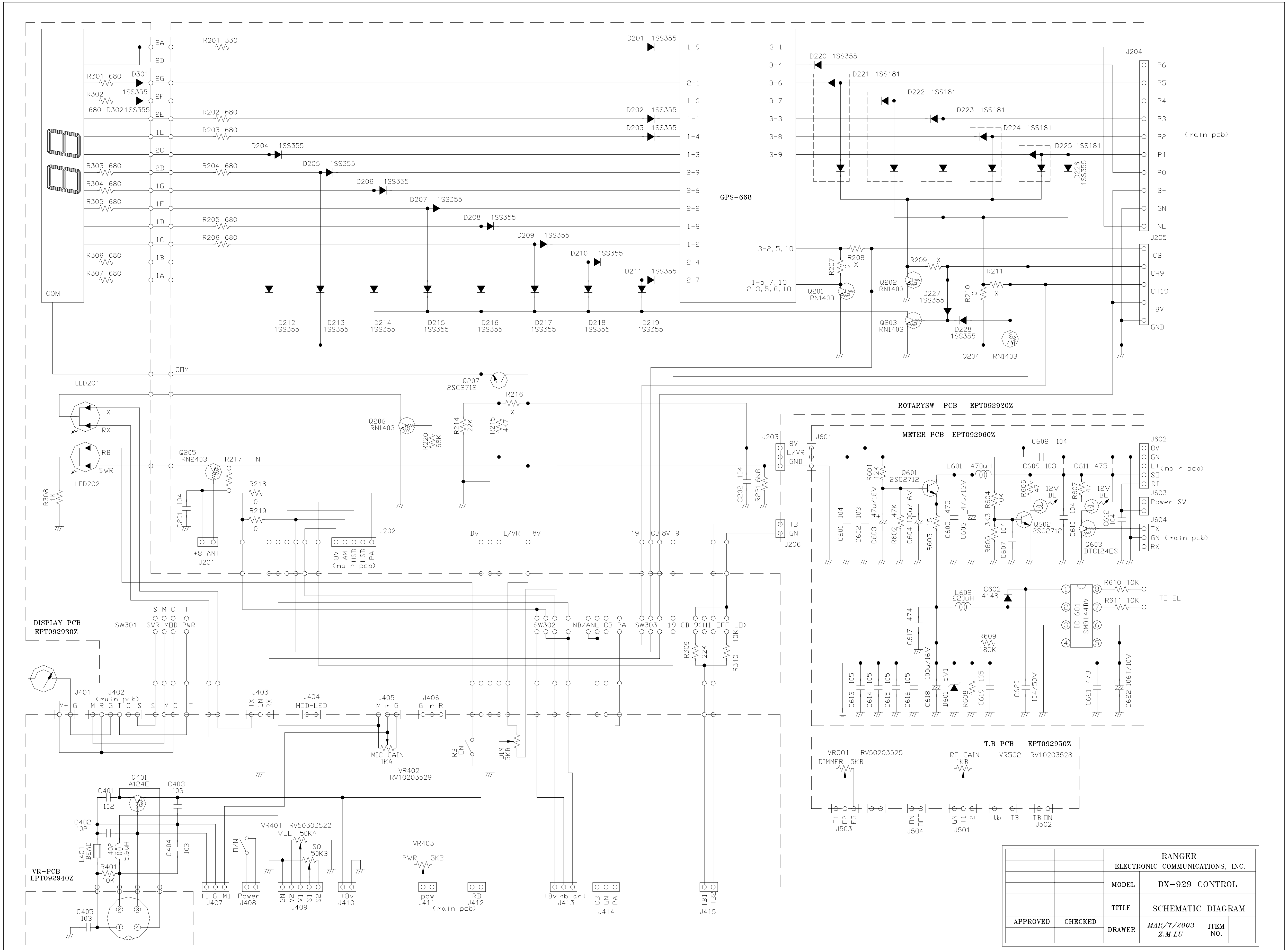
PART LIST
DX 919 MAIN PCB

REFERENCE NUMBER	RANGER PART NO.	DESCRIPTION
	EPT092913Z	MAIN PCB
R19,305,258(B239)	RCP160004Z	0 Ω 1/16W
R246	RCP161004Z	10 Ω 1/16W
R267,241(B236)	RCP161504Z	150 Ω 1/16W
R133,213,253,282	RCP164704Z	47 Ω 1/16W
R130,215,220,249	RCP165604Z	56 Ω 1/16W
R11	RCP166804Z	68 Ω 1/16W
R5,8,30,33,76,81,174,260	RCP161014Z	100 Ω 1/16W
R32,245(B236)	RCP161514Z	150 Ω 1/16W
R23	RCP161814Z	180 Ω 1/16W
R140,163,177,259(B239)	RCP162214Z	220 Ω 1/16W
R31	RCP162714Z	270 Ω 1/16W
R6,10,16,24,248,254,300	RCP163314Z	330 Ω 1/16W
R188,268,293	RCP164714Z	470 Ω 1/16W
R266	RCP165614Z	560 Ω 1/16W
R4,50,209,89	RCP166814Z	680 Ω 1/16W
R74	RCP168214Z	820 Ω 1/16W
R62,64,67,72,115,116,118, 122,123,136-138,160,164, 179,186,189,205,206,214, 303,232,237,261,269,291, 292,295,320,VR12(B236)	RCP161024Z	1K Ω 1/16W
R192	RCP161224Z	1.2K Ω 1/16W
R132,207,233,247, 255,273,79,80	RCP161524Z	1.5K Ω 1/16W
R226	RCP161824Z	1.8K Ω 1/16W
R20,27,71,75,134, 162,283,313	RCP162224Z	2.2K Ω 1/16W
R9,25,28,121	RCP162724Z	2.7K Ω 1/16W
R18,22,66,73,128, 191,219,274	RCP163324Z	3.3K Ω 1/16W
R52,57	RCP163924Z	3.9K Ω 1/16W
R26,165,190,195,196,131	RCP164724Z	4.7K Ω 1/16W
R264,265	RCP165624Z	5.6K Ω 1/16W
R14,40,41,70,82,312	RCP166824Z	6.8K Ω 1/16W
R275	RCP168224Z	8.2K Ω 1/16W
R1,13,17,65,68,159,161,175, 181,202,210,216,227-231,272, 276,296,297,262	RCP161034Z	10K Ω 1/16W
R178,310	RCP161234Z	12K Ω 1/16W
R180	RCP161534Z	15K Ω 1/16W
R187,208	RCP162234Z	22K Ω 1/16W
R2,309,311	RCP163334Z	33K Ω 1/16W
R46	RCP163934Z	39K Ω 1/16W
R7,29,61,63,185,218,126,157, 222,224	RCP164734Z	47K Ω 1/16W
R21,105,107	RCP166834Z	68K Ω 1/16W
R45	RCP168234Z	82K Ω 1/16W
R12,42,43,44,51,53,104,108, 112,182,184,221,225,278	RCP161044Z	100K Ω 1/16W
R47,117,135,139,194	RCP162244Z	220K Ω 1/16W
R49,55,176	RCP162744Z	270K Ω 1/16W
R15,111,183	RCP164744Z	470K Ω 1/16W
R48	RCP168244Z	820K Ω 1/16W
R106	RCP161054Z	1M Ω 1/16W
R193	RCP161554Z	1.5M Ω 1/16W
R124	RCP161064Z	10M Ω 1/16W
R244(B236)	RCP141514Z	150 Ω 1/4W
R239	RCP121034Z	10K Ω 1/2W
C8	CC0508204L	82PF 50WV
C4	CC0501015L	100PF 50WV
C137	CC0501515L	150PF 50WV
C31,136	CC0502715L	270PF 50WV
C11,14	CC0503315L	330PF 50WV
C23	CC0505615L	560PF 50WV
C52,197	CC0500101A	1PF 50WV
C225	CC0500201A	2PF 50WV
C218	CC0500301A	3PF 50WV
C61,62,90	CC0500501A	5PF 50WV
C108,1,49	CC0501004A	10PF 50WV
C84,89	CC0501504A	15PF 50WV
C43	CC0501804A	18PF 50WV
C54,55	CC0502204A	22PF 50WV
C119,279,226,287	CC0503304A	33PF 50WV
C195	CC0503904A	39PF 50WV
C202,224,147,150	CC0504704A	47PF 50WV
C88,116,117	CC0506804A	68PF 50WV
C194,192	CC0501515A	150PF 50WV
C196,222,295	CC0501815A	150PF 50WV
C139	CC0503904D	39PF 50WV
C130	CC0502004G	20PF 50WV
C281	CC0501015G	100PF 50WV
C282	CC0501815G	180PF 50WV
C220	CC0502215G	220PF 50WV
C86	CC0502715G	270PF 50WV
C201,203	CC0503915G	390PF 50WV
C210	CC0504715G	470PF 50WV
C74,85	CC0505615G	560PF 50WV
C199	CD3005614Z	560P 300WV
C7,47,50,95,99,110,118,120, 174,183, 244,245,100, 246	CC0501027L	0.001UF 50WV
C81,173,193,206,207, 236, 213,234,250,256,259,272, 249,302,270,177, 292,40, 171,235,211(B236), 215(B236)	CC0501047L	0.1UF 50WV
C5,18,20,48,87,92, 96,102,105,106,257,151,160, 233,240,247,251,253,258,260, 261,263,217,65	CC0504737L	0.047UF 50WV
C32,42,45,46,221,162,163	CC0504727L	0.0047UF 50WV
C155	CC0502237L	0.022UF 50WV
C200	CC1001037L	0.01UF 100WV
C2,3,6,9,15,17,19,51,57, 58, 60,109,114,138,161,16,189, 205,219,229,230,232,241, 265,267,269,271,278 ,298, 188,305,306,307,308,309, 310,311,312,262,216,285	CC0501037L	0.01UF 50WV
C154	CT0162246Z	0.22UF 16WV
C97	CT0161046Z	0.1UF 16WV
C98,180,299,300	CT0162256Z	2.2UF 16WV
C178,296	CM0501045Z	0.1UF 50WV
C237,78	CM0501024Z	0.001UF 50WV
C184	CM0501035Z	0.01UF 50WV
C39,185	CM0502235Z	0.022UF 50WV
C176	CM0504725Z	0.0047UF 50WV
C34	CM0504735Z	0.047UF 50WV
C12	CM0502225Z	0.0022UF 50WV
C198	CE0501047Z	0.1UF 50WV
C10	CE0504747Z	0.47UF 50WV
C67,75,153,157,170,186,187	CE0501057Z	1UF 50WV
C159,214	CE0502257Z	2.2UF 50WV
C103,182	CE0504757Z	4.7UF 50WV
C13,21,22,44,82,115,158,275, 276,239	CE0251067Z	10UF 25WV
VC1	CV038200AZ	TRIMMER/C 20P (CV38D2001)
C80,181	CE0252267Z	22UF 25WV

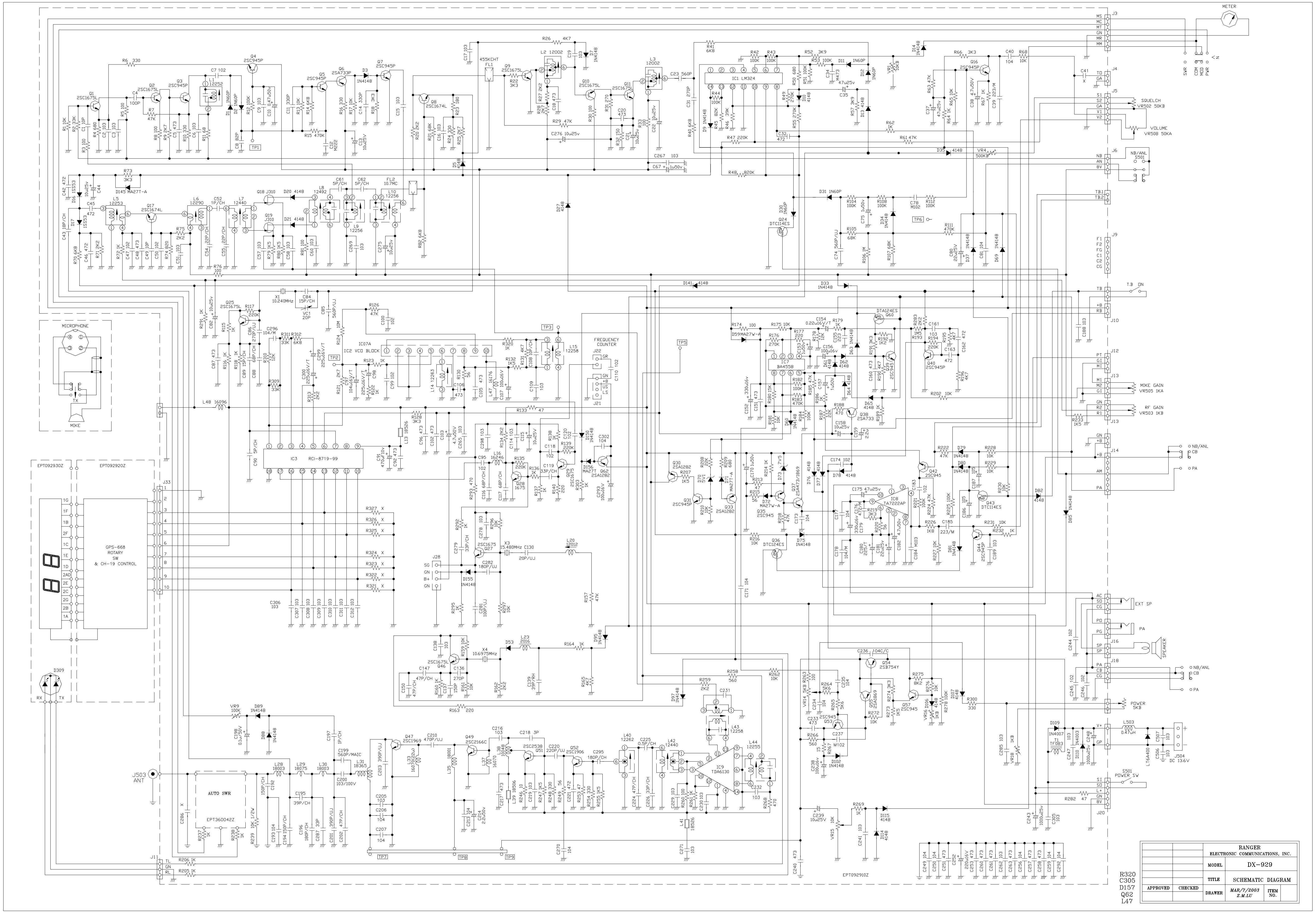
C37,175,38	CE0254767Z	47UF 25WV
C156,238,293,107	CE0161077Z	100UF 16WV
C252	CE0162277Z	220UF 16WV
C152,179	CE0163377Z	330UF 16WV
C91	CE0104777Z	470UF 10WV
C243,248	CE0251087Z	1000UF 25WV
C35	CEM254767Z	47UF 25WV
FL1	EFCFW455HT	CFW-455HT
FL2	EFCFE107MX	SFE10.7MX
X1	EYCAB10240	10.240MHZ
X3	EYBAA15480	15.480 MHZ
X4	EYBAE10697	10.6975MHZ 1
IC1	ENSS00324Z	LM324
IC3	ENRG871999	RCI-8719A
IC7	ENRO04558Z	BA4558
IC9(B239)	ENRCI6130Z	RCI-6130
VCO	ENNOHIC07A	UHIC07A
Q8,17	T2SC01674L	2SC1674L
Q51	T2SC02538Z	2SC2538
Q52	T2SC01906Z	2SC1906
Q36	TDTC0124ES	DTC124ES
Q24,43	TDTC0114ES	DTC114ES
Q60	TDTA0124ES	DTA124ES
Q30,33,62	T2SA01282E	2SA1282AE
Q1,2,9,10,11,25,28,29,46,27	T2SC01675L	2SC1675L
Q3,4,5,7,16,31,35,39,40,42, 44,53,57	T2SC00945P	2SC945P
Q6,38	T2SA00733P	2SA733P
Q55	T2SA01869Z	2SA1869
Q18,19	FMOJ00310Z	F.E.T J310
D3-5,7,9,10,13,14,20,21,27, 96,33-35,37,53,60-65,69, 75-81,88,89,102,106,107,141, 150,97,82,155,85,95,115,114, 90(B236),92(B236),93(B236)	ED1NM4148Z	1N4148
D1,2,11,12,30,31	ED1N00060P	1N60P
D110	ED1N04003Z	1N4003
D109	ED1N04007Z	1N4007
D16,17	EDSS00053Z	1SS53
D59,72	EDMA00027W	MA27W-A
D71,145,156	EDMA00027T	MA27T-A
D70	EDZD05519Z	5.1V 0.5W
D73	EDZD05759Z	7.5V 0.5W
L2,3	ECIFT12002	7MC-7172ABw
L6	ECIFT12290	I.F.T.
L20	ECIFT12012	I.F.T. 113CN-6514X
L23	ECIFT12016	I.F.T. 113CN-6344Z
L1	ECIFT12252	I.F.T.
L44	ECIFT12255	I.F.T.
L9,10	ECIFT12256	I.F.T.
L15	ECIFT12258	I.F.T.
L40	ECIFT12262	I.F.T.
L14	ECIFT12263	I.F.T.
L43(B239)	ECIFT12265	I.F.T.
C306(L43 PIN4&6)(B239)	CK1820AA4A	82PF 50WV
L7,42	ECIFT12253	I.F.T.
L5	ECIFT12440	I.F.T.
L8	ECIFT12492	I.F.T.
L48	ECCHK16096	470UH
L503	ECCHK16000	0.47UH
T1	ECCHK16004	1.1MH EI-19
L33,37	ECCHK16070	22UH
L47	ECCHK16176	4.7UH
L16	ECCHK16246	22UH
L30	ECSPG18003	SPRING COIL
L29,28(B236)	ECSPG18075	SPRING COIL
L31	ECSPG18365	SPRING COIL
L35	ECSPG18001	SPRING COIL
L38	ECRFZ10048	25 UH
L39	ECBAD18506	BEAD COIL
L41,13	ECBAD18526	BEAD COIL

VR16,18	RE10200041	S/F/R 1K VM6CK
VR14	RE50200042	S/F/R 5K VM6CK
VR1,15	RE10300031	S/F/R 10K VM6CK
VR9	RE10400043	S/F/R 100K VM6CK
VR4	RE50400087	S/F/R 500K Ω
MIC I/P,Q14 C&E(SH3028)	WX01070702	JUMP WIRE
JP5,14,15,16,17,18,30,35, 36,37,39,63,68,69,75,76,87,88 ,91,92,100,102,103 ,104,108, 110,114,120,124,125,126,129, 133,148,19,153,TP8,C131, C133,C142,R241,JP9,JP13, JP127	WX01070705	JUMP WIRE
JP31,41,43,46,79,80,82,84,97, 106,155,6	WX01070706	JUMP WIRE
JP25,57,70,71,96,116,117, 122,123,130,142,207,119,141, D25,D50,JP3	WX01070707	JUMP WIRE
JP22,29,132	WX01070708	JUMP WIRE
JP11,20,38,40,42,83,4,IC6, JP128	WX01070709	JUMP WIRE
JP7,10,26,27,44,61,62,65,72, 73,74,78,33,89,95,114,115, 138,150,151,152,66,67,77,105 ,146,147,149	WX01070710	JUMP WIRE
JP8,21,51,139,86	WX01070711	JUMP WIRE
JP12,52,140	WX01070712	JUMP WIRE
JP48,111,137,144,154,34, 145,8	WX01070713	JUMP WIRE
JP32,93,FL3,D26	WX01070714	JUMP WIRE
JP1,47,49,50,54,56,58,90, 121,143	WX01070715	JUMP WIRE
TP7-TP8,TP8-TP9	WX01070718	JUMP WIRE
J7,17,22,25,31,34	EX07N48223	P/C/S 2P
J6,11,18,32	EX07N48350	P/C/S 3P
J21	EX07N48490	P/C/S 4P
J3,5,20	EX07N48222	P/C/S 5P
J14	EX07N48331	P/C/S 6P
J33	EX07N48209	P/C/S 10P
J12	EX07N41227	P/C/S 3P
SP(J16)	EX07N41330	P/C/S 2P
TP2,3,5	EX07N48612	1PIN L=11.8
PA,EXP SP	EX06N41045	EAR JACK
L503	WX0012015A	TUBE
L504	WH0007005Z	LEAD WIRE

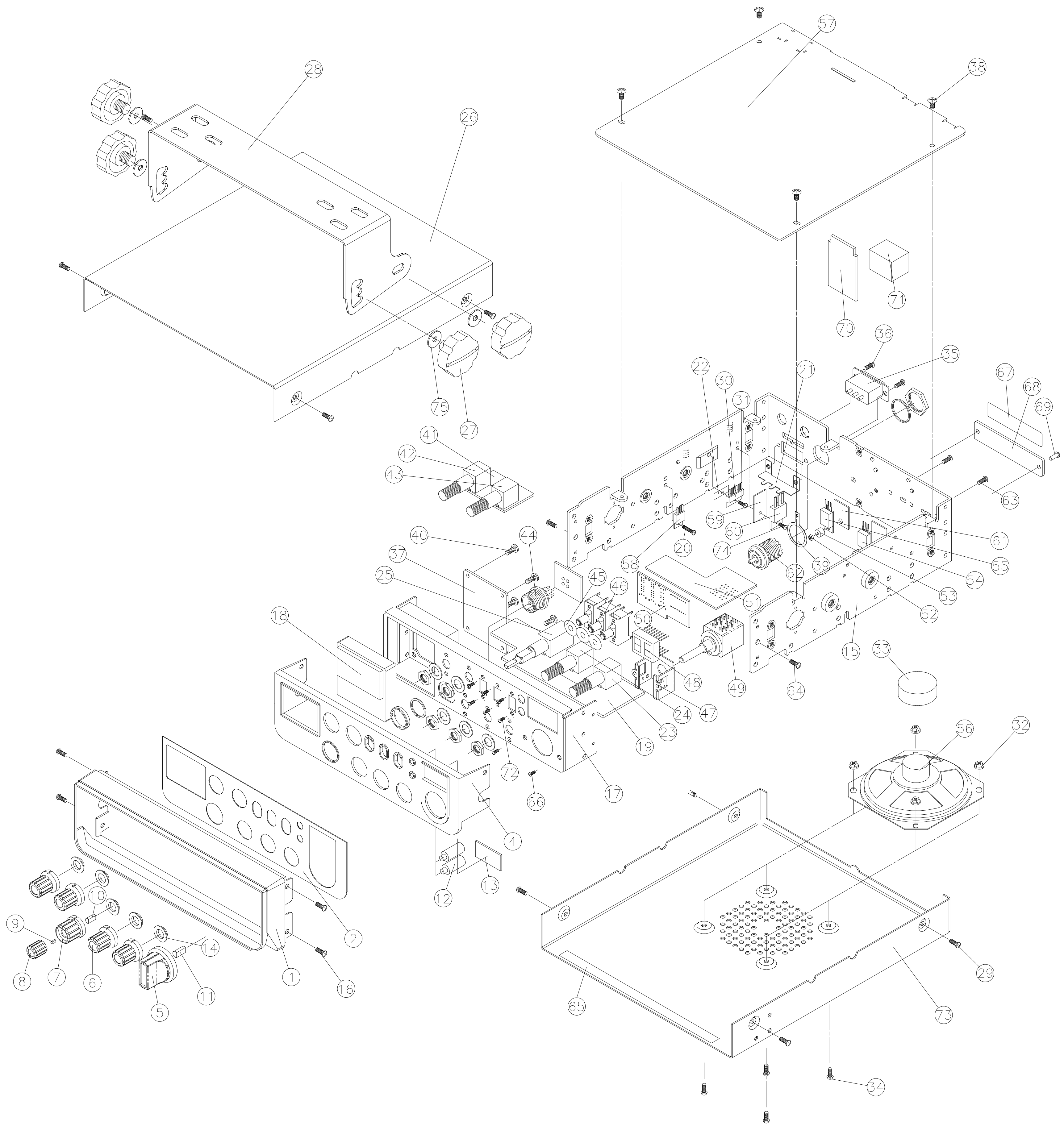
DX 919 SCHEMATIC DIAGRAM (CONTROL PCB)



DX 919 SCHEMATIC DIAGRAM (MAIN PCB)



DX 919 EXPLODE DRAWING



DX 919 MECHANICAL PART

	NO.	PART NUMBER	PART NAME	QT'Y
	1	PT0919010A	FRONT PAHEL	1
*	2	BT0919030A	ID PLATE DX919	1
*	3			1
	4	PT0919020A	FRONT HOUSING	1
	5	PT148N021A	CH KNOB	1
*	6	PT148N031A	VR KNOB	4
*	7	PT148N090A	OUTER KNOB	1
*	8	PT148N100A	INNER KNOB	1
*	9	MT3600100T	D SPRING D	1
*	10	MT3600090T	D SPRING B	1
	11	MT3600080T	D SPRING A	1
	12	PTDX55040A	LED BAR	2
	13	PTDX55020B	DISPLAY WINDOW	1
	14	PT3600090A	KNOB WASHER	5
	15	MT0919030X	SET CHASSIS	1
	16	JS033006MN	SCREW M3X6	4
	17	MT0919010X	FRONT CHASSIS	1
	18	EX03N40482	SIGNAL METER	1
	19	EPT092940Z	VR PCB	1
	20	JS052006MN	SCREW M2X6	1
	21	MT3600050X	DC SOCKET HOLDER	1
	22	LZZZ61008Z	IC SHIELD B	1
*	23	RV50203525	VR 5KB	1
*	24	RV10203529	VR 1KA	1
	25	RV50303522	VR 50KB/50KA SW	1
	26	MT1200011K	TOP HOUSING	1
	27	XZZZ90007Z	MOUNTING SCREW	4
	28	MT1200090A	MOUNTING BRACKET	1
	29	JS053006MN	SCREW M3X6	8
	30	ENTA07222P	TA7222AP	1
	31	JS013006MV	SCREW M3X6	1
	32	JN263035ZS	NUT WITH WASHER	4
	33	QT7799010A	RUBBER COVER	1
	34	JS053008MN	SCREW M3X8	4
	35	EX06T40007	DC SOCKET 3P	1
	36	JS053008MN	SCREW M3X8	2
	37	EPT092960Z	METER PCB	1
	38	JS053006MN	SCREW T3X6	5
	39	XZZZ90423Z	SOLDER PLATE	1
	40	JS053006TH	SCREW T3X6	4
	41	EPT092950Z	TB PCB	1
*	42	RV10203528	VR 1KB	1
*	43	RV50203525	VR 5KB	1
	44	EX06N41101	MIC JACK 4P	1
	45	XZZZ90296A	MASK PLATE(SW)	3
	46	EWSL31027K	SLIDE SW 3N	3
	47	MTDX55042X	SW CHASSIS (CH)	1
	48	EX03N40419	LED DISPLAY	1
	49	EWRT32059S	ROTARY SW	1
	50	EPT092930Z	DISPLAY PCB	1
	51	EPT092920Z	ROTARY SW PCB	1
	52	JN242012ZS	NUT M2X1.2t	2
	53	XZZZ90003Z	INSULATING RING	2
	54	T2SC02166C	TR 2SC2166C	1
	55	T2SC01969C	TR 2SC1969C	1
	56	ES300835SQ	SPEAKER 8OHM	1
	57	EPT929013Z	MAIN P.C.B.	1
	58	T2SA01869Z	TR 2SA1869	1
	59	XZZZ90020Z	INSULATING PLATE	1
	60	T2SB00754Y	TR 2SB754Y	1
	61	XZZZ90358Z	INSULATING PLATE	2
	62	EX06T41019	ANT SOCKET	1
	63	JS052012MN	SCREW M2X12	2
	64	JS053004MN	SCREW M3X4	2
	65	LZZZ60082Z	SHIELD CLOTH	2
	66	JS053008MN	SCREW M3X8	2
	67	LZZZ61570A	PART 15 LABEL	1
*	68	BT0919040A	FCC PLATE DX919	1
	69	JF413206ZX	BLIND RIVET	2
	70	EPT360042Z	ANT PCB	1
	71	XZZZ90422Z	FOAM14X16X20MM	1
	72	JS052604MN	SCREW M2.6X4	6
	73	MT1200210K	BOTTOM HOUSING	1
	74	JS052010MN	SCREW M2X10	1
	75	XZZZ90188Z	FIBER WASHER	4

JULY 2003

UPDATES & CORRECTIONS

Any updates or corrections to this Service Manual will be included in the Tech Support section of our website at www.GalaxyRadios.com.

Galaxy Two Year Warranty

This new Galaxy radio is covered by a two year limited warranty. Here are the details.

- All of our Galaxy radio model numbers begin with the letters “DX” and are covered by our Limited Two Year Parts and Labor Warranty.

- “Limited” means that we will repair problems caused by factory defects or normal use at no charge. Work performed by qualified technicians which did not cause any damage to the radio will not void the warranty and will be left intact. Problems caused by unqualified technicians or operator abuse can also be repaired, but there will be a charge.

- The warranty period begins when the radio is first purchased. However, in the event that the dated sales receipt has been lost or the radio was purchased used, our radios are still covered for 26 months from the date of manufacture based on the serial number. Our warranty comes with the radio and remains valid even if you sell the radio to someone else. Refurbished radios are distinguised from new radios by using the letter “R” as the first character of the serial number.

There are no off-site “Factory Authorized” service centers for Galaxy “DX” models. All warranty work must be done at our facility.

For maximum convenience, these radios may be shipped directly to us for repair after obtaining a Repair Authorization Number (RAN). This RAN may be obtained from our website or by calling our Service Department at 760-480-8800 between 10:00 AM and 4:00 PM Pacific Time. The RAN must be written below your return address on the outside of the shipping box. Boxes, which arrive without an RAN, will be refused, and the shipping company will return the unopened box to you. Be sure to have a pen and paper ready along with the serial number of your radio before calling. We will give you the RAN and our shipping address over the phone.

When you send your radio, please include a copy of the sales receipt and a note with a detailed description of the symptoms, especially if they are intermittent. This will help our technicians locate the problem so we don’t waste time sending the radio back and forth. If possible, please include a daytime phone number in case our technicians have any questions. Do not send your bracket, power cord or microphone unless we ask you for these items during our phone conversation.

You are responsible for getting the radio safely to us. (We suggest using United Parcel Service - UPS.) You must pay to ship the radio to us, and we will pay to ship the radio back to you. Since we use UPS and they do not deliver to Post Offices boxes, please provide us with a street address for the return of your radio. Be sure to print clearly.

We appreciate your choosing a Galaxy radio and we will make every effort to get you back on the air as soon as possible.

Be sure to visit our web site at: www.GalaxyRadios.com.

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